

B.Sc. BOTANY
THIRD SEMESTER [SPECIAL REPEAT]
CYTOLOGY & GENETICS
BSB-303

SET
A

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1×20=20

- Chromosomes are duplicated during which phase of the cell cycle?
 - G1 phase
 - G2 phase
 - S phase
 - Prophase
- Genotype of dominant plant can be determined by:
 - Pedigree analysis
 - Test cross
 - Back cross
 - Dihybrid cross
- Which human chromosomes are involved in Down's syndrome?
 - 6
 - 14 and 21
 - 8 and 12
 - X and Y
- Which one is the correct ratio, when F1 hybrids have dominant recessive alleles at one gene locus and recessive lethal alleles at the second locus?
 - 3:2:5:4
 - 6:4:3:2
 - 6:4:3:4
 - 3:1:6:2
- Colchicine is used to cause.....
 - Mitotic non-disjunction
 - Meiotic non-disjunction
 - Mitotic disjunction
 - Meiotic disjunction
- If the blood group of both the parents is AB, the possible blood group of children will be:
 - A, B, AB and O
 - A and B
 - A, B, O
 - A, B, AB
- Aneuploidy is usually deleterious because:
 - Chromosomal pairing is hampered
 - Size of individual may vary
 - Chromosomal disintegration is increased
 - Gene balance is disrupted
- Given below are two statements.
I: XX-XY type of sex determination is a means of male heterogamety.
II: In birds male heterogamity is seen as males produces two different types of gametes.
 - Both statements I & II are true
 - Statement I is true and statement II is false
 - Both statements I & II are false
 - Statement II is true and statement I is false
- Who discovered the cell and when?
 - Schwann in 1885
 - Tatum in 1664
 - Robert Hooke in 1665
 - De Bary in 1760

10. In pea pure tall plant (TT) is crossed with sort plants (tt). What will be the ration of pure tall and short plants in F2 generation?
- a. 1:1
b. 1:3
c. 3:1
d. 2:1
11. Cell wall is mainly made up of:
- a. Protein
b. Cellulose
c. Lipid
d. Starch
12. In protein synthesis, translocation is initiated with the movement of:
- a. tRNA from P-site to the A-site
b. tRNA from A-site to P-site
c. dipeptidyl tRNA from A-site to P-site
d. tRNA from P-site to E-site
13. What is the function of the centrosome?
- a. Osmoregulation
b. Secretion
c. Photosynthesis
d. Formation of spindle fibers
14. On the ribosome, mRNA binds:
- a. Between the subunits
b. To the small subunit
c. To the large subunit
d. None of these
15. Crossing over occurs in the:
- a. Diakinesis stage
b. Anaphse stage
c. Pachytene stage
d. Leptotene stage
16. Eukaryotic mRNA binding to the ribosomes is facilitated by.....
- a. the 7-methyl guanosine cap
b. tRNA
c. poly A tail
d. the Shine Dalgarno sequence
17. Repulsion and coupling are two sides of the same coin:
- a. Crossing over
b. Chiasmata
c. Linkage
d. Mutation
18. What is the length of the DNA double helix, if the total number of bp (base pair) is 6.6×10^9 ?
- a. 2.2 m
b. 2.5 m/bp
c. 2.5 m
d. 2.2 m/bp
19. When there is an increase in the condensation of chromatin during the process of cell division:
- a. Heterochromatin increases
b. Euchromatin increases
c. Differentiation of euchromatin and heterochromatin increases
d. Differentiation of euchromatin and heterochromatin decreases
20. Which carbon atom is bonded to N-9 of purine?
- a. C-2
b. C-3
c. C-1
d. Both B and C

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

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| 1. Describe the process of Linkage and Crossing-over and their importance in inheritance. | 5+5=10 |
| 2. Write short notes on:
a) Difference between phenotype and genotype.
b) Co-dominance with proper example. | 5+5=10 |
| 3. Describe briefly about the different chromosomal aberrations. | 10 |
| 4. Write a short note on the following:
a) Sex Chromosome
b) Genic balance theory of sex determination in Drosophila. | 5+5=10 |
| 5. Describe the structure and function of microfilaments and microtubules. | 5+5=10 |
| 6. Write short notes on:
a) Polygenic inheritance with proper examples.
b) Double helical structure of A, B, Z DNA. | 4+6=10 |
| 7. Write the process of transcription in prokaryotes with proper diagram. | 10 |
| 8. Write the process of translation in prokaryotes with proper diagram. | 10 |

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